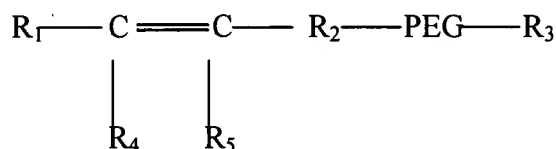


### CLAIMS LISTING

1. (Currently Amended) A composition ~~of matter~~ comprising:  
a crystalline colloidal array comprising ordered particles; and  
a polymeric matrix encapsulating said crystalline colloidal array, wherein  
said polymeric matrix comprises polymerized poly(ethylene glycol) based monomer  
units polymerized among the ordered particles of the crystalline colloidal array.
2. (Currently Amended) The composition ~~of matter~~ of claim 1, wherein said  
composition ~~of matter~~ is biologically compatible.
3. (Currently Amended) The composition ~~of matter~~ of claim 1, wherein said  
crystalline colloidal array is electrostatically stabilized.
4. (Currently Amended) The composition ~~of matter~~ of claim 1, wherein said  
poly(ethylene glycol) based monomer units have a general formula of:



wherein  $R_2$  comprises a functional group having at least two active  
bonding sites,

$R_1$ ,  $R_4$  and  $R_5$  are each independently selected from the group consisting  
of alkanes, alkenes, arenes, halides, ethers, acrylates, amine groups, amides, thiols,  
esters, ketones, nitro compounds, carboxy groups, hydroxy groups, and hydrogen, and

$R_3$  is selected from the group consisting of alkanes, alkenes, arenes,  
halides, ethers, acrylates, amine groups, amides, thiols, esters, ketones, nitro  
compounds, carboxy groups, hydroxy groups, hydrogen, proteins, nucleotides, and  
antibodies.

5. (Currently Amended) The composition ~~of matter~~ of claim 4, wherein  $R_2$  is  
selected from the group consisting of ketones and esters.
6. (Currently Amended) The composition ~~of matter~~ of claim 5, wherein said  
poly(ethylene glycol) based monomer comprises poly(ethylene glycol) methacrylate.

7. (Currently Amended) The composition of ~~matter~~ of claim 4, wherein R<sub>3</sub> is selected from the group consisting of proteins, nucleotides, and antibodies.

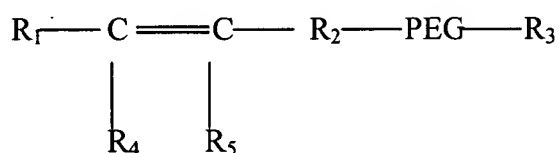
8. (Currently Amended) The composition of ~~matter~~ of claim 1, wherein said crystalline colloidal array comprises polystyrene-based colloidal particles.

9. (Currently Amended) The composition of ~~matter~~ of claim 1, further comprising a crosslinking agent polymerized with said polymeric matrix.

10. (Currently Amended) The composition of ~~matter~~ of claim 1, wherein upon receiving electromagnetic radiant energy said composition of ~~matter~~ exhibits a visible photonic bandgap.

11. (Currently Amended) The composition of ~~matter~~ of claim 10, wherein said visible photonic bandgap is capable of shifting upon environmental stimulation of said composition of ~~matter~~.

12. (Currently Amended) A composition comprising:  
a crystalline colloidal array comprising ordered polystyrene-based colloidal particles in an aqueous medium; and  
a polymeric matrix encapsulating said crystalline colloidal array, wherein said polymeric matrix comprises polymerized poly(ethylene glycol) based monomer units represented by:



wherein R<sub>2</sub> comprises a functional group having at least two active bonding sites,

R<sub>1</sub>, R<sub>4</sub> and R<sub>5</sub> are each independently selected from the group consisting of alkanes, alkenes, arenes, halides, ethers, acrylates, amine groups, amides, thiols, esters, ketones, nitro compounds, carboxy groups, hydroxy groups, and hydrogen,

R<sub>3</sub> is selected from the group consisting of alkanes, alkenes, arenes, halides, ethers, acrylates, amine groups, amides, thiols, esters, ketones, nitro

compounds, carboxy groups, hydroxy groups, hydrogen, proteins, nucleotides, and antibodies, and

a crosslinking agent polymerized with said monomer units, wherein said monomer units are polymerized among the ordered particles of the crystalline colloidal array.

13. (Original) The composition of claim 12, wherein said composition is biologically compatible.

14. (Original) The composition of claim 12, wherein  $R_2$  is selected from the group consisting of ketones and esters.

15. (Original) The composition of claim 12, wherein said poly(ethylene glycol) based monomer comprises poly(ethylene glycol) methacrylate.

16. (Original) The composition of claim 12, wherein  $R_3$  is selected from the group consisting of proteins, nucleotides, and antibodies.

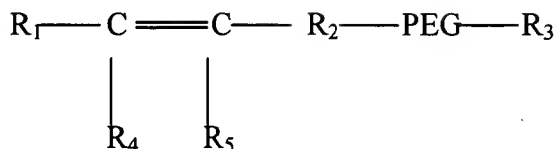
17. (Original) The composition of claim 12, wherein upon receiving radiant energy said composition exhibits a visible photonic bandgap.

18. (Original) The composition of claim 17, wherein said visible photonic bandgap is capable of shifting upon environmental stimulation of said composition.

19. (Currently Amended) A sensory device comprising:  
a crystalline colloidal array comprising an ordered lattice structure defining a visible bandgap at a first wavelength;  
a polymerized matrix encapsulating said crystalline colloidal array, said polymerized matrix comprising poly(ethylene glycol) based monomer units polymerized among the ordered lattice structure of the crystalline colloidal array; and  
wherein upon stimulation of said sensory device said visible bandgap is capable of shifting to a second wavelength.

20. (Original) The sensory device of claim 19, wherein said sensory device is biologically compatible.

21. (Original) The sensory device of claim 19, wherein said poly(ethylene glycol) based monomer units are represented by:



wherein  $R_2$  comprises a functional group having at least two active bonding sites,

$R_1$ ,  $R_4$  and  $R_5$  are each independently selected from the group consisting of alkanes, alkenes, arenes, halides, ethers, acrylates, amine groups, amides, thiols, esters, ketones, nitro compounds, carboxy groups, hydroxy groups, and hydrogen, and

$R_3$  is selected from the group consisting of alkanes, alkenes, arenes, halides, ethers, acrylates, amine groups, amides, thiols, esters, ketones, nitro compounds, carboxy groups, hydroxy groups, hydrogen, proteins, nucleotides, and antibodies.

22. (Original) The sensory device of claim 21, wherein said wavelength shift is defined by a chemical reaction between said poly(ethylene glycol) based monomer units and an environmental component.

23. (Original) The sensory device of claim 22, wherein  $R_3$  is selected from the group consisting of proteins, nucleotides, and antibodies.

24. (Original) The sensory device of claim 19, wherein said wavelength shift is defined by a mechanical stimulation of said sensory device.

25. (Original) The sensory device of claim 19, wherein said wavelength shift is defined by a thermal stimulation of said sensory device.

26. (Original) The sensory device of claim 19, wherein said wavelength shift is defined by an electrical stimulation of said sensory device.

27. (Original) The sensory device of claim 19, wherein said wavelength shift is defined by a chemical stimulation of said sensory device.

28. (New) A composition comprising:  
an aqueous solution comprising a high molecular weight poly(ethylene glycol) based macromolecule in a concentration such that the viscosity of the solution is increased due to the presence of the macromolecule concentration; and

a crystalline colloidal array within the aqueous solution.

29. (New) The composition of claim 28, wherein the poly(ethylene glycol) based macromolecule has the general formula:



wherein  $R_1$  and  $R_2$  are independently selected from the group consisting of alkanes, alkenes, arenes, halides, ethers, acrylates, amine groups, amides, thiols, esters, ketones, nitro compounds, carboxy groups, hydroxy groups, hydrogen, proteins, nucleotides, and antibodies.

30. (New) The composition of claim 28, wherein said crystalline colloidal array comprises polystyrene-based colloidal particles.

31. (New) The composition of claim 28, wherein upon receiving electromagnetic radiant energy said composition exhibits a visible photonic bandgap.

32. (New) The composition of claim 28, wherein said visible photonic bandgap is capable of shifting upon environmental stimulation of said composition.

33. (New) The composition of claim 28, wherein the concentration of the macromolecule is between about 10% and about 80% by weight of the solution.

34. (New) The composition of claim 28, wherein the poly(ethylene glycol) has a molecular weight between about 10,000 and 100,000.